Unanimous Consent Agreements: Going Along in the Senate

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In recent decades, U.S. senators have made increasing use of complex unanimous consent agreements (UCAs) which preclude filibusters by setting a time for a final vote on legislation and which often specify permissible amendments and their proposers. Because of the numerous dilatory tactics permitted in the absence of a UCA, controversial legislation is often doomed unless such an agreement is reached. But in spite of correspondingly strong temptations for opponents to object to unanimous consent requests (UCRs), consent is prevalent. This paper addresses the puzzle with a decision-theoretic model that yields a rather stringent condition for objection to a UCR. Two cases of objection in the Senate are analyzed and found to support hypotheses derived from the model. A concluding discussion considers UCAs as endogenous institutions that permit Senate leaders to induce behavior that appears cooperative but is nonetheless consistent with individual utility maximization.

"If you want to get along, you've got to go along." "Be a workhorse, not a showhorse." "Freshmen are to be seen, not heard." Congressional scholars are likely to be as familiar with these statements as with Fiorina's *Keystone* or Mayhew's *Electoral Connection*. But if recent firsthand observations are any guide, the good old days may be gone. Former Senate Majority Leader Howard Baker claims that "leading the Senate is like trying to push a wet noodle." And his successor, Bob Dole, apparently concurs: "There's a lot of free spirits in the Senate. About 100 of them."[1]

Quips and quotes about the good old days are common in American politics, notwithstanding persuasive evidence to the contrary, such as Polsby's (1968) accounts of cane-beatings, hunting dogs, fisticuffs and

* Tom Gilligan and Doug Rivers were very helpful in the early stages of this research, as was Walter Oleszek, who brought the cases to my attention. Burdett Loomis propounded the title, and an initial version was presented at the 1985 Meeting of the Midwest Political Science Association, Chicago, IL. Ross Baker and Richard Fenno were valuable discussants there. Subsequently, constructive comments were offered by Barry Weingast, Rod Kiewiet, Eric Uslaner, Carolyn Weaver, Jon Bendor, and John Ferejohn.

[1] See Ehrenhalt (1984), p. 819.

discharged pistols in the early House of Representatives. But regardless of whether these are good or bad days in the Senate, some "norms" or "folkways" (Asher, 1973; Matthews, 1960) have changed over the years (Rohde et al., 1985), and norms probably never were constants of legislative behavior (Huitt, 1961). The so-called unwritten rules of the chamber are usually obeyed, but sometimes they are bent and occasionally they are broken.

This paper reconsiders norms from a rational-choice perspective in a narrowly defined setting. Its empirical motivation is that with increasing frequency U.S. senators can unilaterally cripple or kill legislation by objecting to a request that it be considered under terms specified by a unanimous consent agreement. Yet instances of this seemingly effortless obstruction are rare.[2] Is unanimous consent common because senators are habitually cooperative, contrary to the suggestions of Baker and Dole? A theory and two cases support an alternative explanation. Senators conform to the "norm of consent" because, if leaders have done their work properly, conformity is consonant with senators' long-term individual goals.

Part I is an overview of unanimous consent agreements (UCAs) and two perspectives on congressional norms. Part II introduces a decision-theoretic model of a senator's choice of consent or objection to a unanimous consent request (UCR). Part III applies the model to two cases from the Senate. Part IV summarizes the study and presents broader implications for leadership strategy and prediction of legislative outcomes.

I. UCAs AND THE NORM OF CONSENT

A unanimous consent request is a proposal to break rules. A unanimous consent agreement is a UCR that receives no objections and therefore supplants the standing rules of the Senate. UCAs may be simple or complex. Simple UCAs are reached perfunctorily and are used, for example, to rescind quorum calls, to insert material into the *Congressional Record*, to add senators as co-sponsors of bills, and to allow staff members to enter the chamber during debate. Simple UCAs are always reached verbally and are usually inconsequential to the passage of legislation.

The focus of this study is on complex UCAs, which are proposed orally but are written and published in the *Record*, the *Senate Calendar*, and whip notices. Complex UCAs are typically products of careful negotiations between senators who have a special interest in the legislation

[2] See Keith (1977) for a uniquely comprehensive historical study of unanimous consent agreements (UCAs). See also Oleszek (1984, pp. 161-164), part of which is based on Keith's study, and Oleszek (1976) for an impressive catalogue of dilatory tactics that are permitted in the absence of a UCA.

to which the agreements pertain. They may specify the rules for debate, who controls debate, the order of measures to be taken up, germaneness restrictions for amendments, and time limitations for almost any conceivable motion (such as amendments to amendments, motions to table or to recommit, appeals, and points of order). So important are these time constraints—including most notably the setting of deadlines for a vote on final passage—that complex UCAs are often called "time limitation agreements" (Keith, 1977, p. 142).

The resemblance between complex UCAs in the Senate and special orders ("rules") in the House is indisputable. Both are bill-specific, endogenously chosen institutional arrangements that serve to limit debate and constrain the amendment process on the floor. There is one crucial distinction, however. A single senator can kill a unanimous consent request, whereas even a sizable minority of representatives is helpless against a minimal winning coalition that favors a special rule. Thus the puzzle: if indeed the contemporary Senate is "in an era of rampant individualism" (Davidson, 1985), then why are lasting objections to complex UCRs rare?[3] Conversely, why is consent common?

One possible answer comes from the conventional sociological notion of norms. The definition of a norm as "a rule or standard of conduct appropriate to a person in a specified situation within a group" (Asher, 1973) seems to pertain to consent to UCRs in the Senate. Without reformulation, however, the concept of a norm cannot satisfactorily explain consent to UCRs. First, the explanation would be virtually tautologous: senators consent to UCRs because to do so is appropriate (i.e., the norm); yet, in reverse, consent is regarded as a norm precisely because senators conform to the appropriate standard. Second, norms as conventionally defined are not useful for deriving testable hypotheses: they define appropriate behavior in a group but are silent on the questions of when and why individual deviations occur. While rare, objections to UCRs do occur, and the mere existence of norms as standards of conduct cannot account for variation.

A newer, modified perspective on norms focuses on strategies of individuals rather than on rules or standards of groups. This strategic perspective is not inconsistent with the preceding conventional perspective of norms as patterns of behavior. But it departs by explicitly entertaining the possibility that such patterns, while typically described as attributes of groups, are nevertheless products of individual self-interested decisions. Individual long-term goal-oriented behavior then takes on the aggregate appearance of a norm in the conventional sense of an unwritten rule.

[3] Lasting objections are differentiated from common but usually innocuous statements of senators "reserving the right to object" while clarifying details of the agreement after which the reservation is withdrawn.

This modified view is similar to that found in Weingast (1979), subsequently generalized in Shepsle and Weingast (1981) and Weingast, Shepsle and Johnsen (1981). Weingast used a "rational choice perspective" to study the "norm of universalism" in public works legislation, and he presented conditions under which self-interested congressmen prefer a cooperative game with universalistic outcomes to a noncooperative game that results in minimal winning but unstable coalitions.[4] In contrast, the model for UCRs is essentially noncooperative, but nevertheless permits cooperation to emerge in Axelrod-like fashion. Consistent with Weingast et al., the observed behavior has the appearance of a norm—in this case the norm of consent. The model also yields concrete and potentially testable implications for Senate leaders, who may schedule UCRs to encourage cooperation even when individuals' temptations to object are severe. Indeed, from the perspective of leaders, an alternative and more activist characterization of "going along in the Senate" might be "the inducement of cooperation among individualists" (cf. Axelrod, 1981).

II. A Theory of Consent

The theory focuses on an individual senator who must decide whether to consent or to object to a UCR. He must select one of two strategies. Strategy α represents consent (going along), and strategy β represents objection (deviation from the norm of consent). The theory captures the essential elements of a senator's decision of whether to observe or ignore a norm, but obviously it is not intended to reflect the full institutional and strategic complexity of the Senate.

By assumption (formally specified below), the senator is tempted to object to a UCR for a pending issue x, because he prefers no change in policy (the status quo, denoted $\tilde{x}$) to the bill that he expects to be passed if a UCA is reached (denoted $\hat{x}$). On the other hand, he is constrained from objecting because there exists some other issue y on which he prefers a new bill, $\hat{y}$, to the status quo, $\tilde{y}$. (Note that tildes always refer to the status quo on the given issue; hats always represent the senator's expectation of the bill's final form.) A senator's objection to the UCR on x necessarily deflates his expectation of a new bill passing on issue y. Finally, the senator believes that his choice of α or β on the UCR for issue x can affect the probabilities of the Senate's ultimate selection of policy outcomes on both x and y. He behaves rationally in accordance with his probability estimates of the effects of his actions.

[4] In their case, the resulting "norm of universalism" (a.k.a. "pork barrel legislation") is not particularly pleasing normatively. But this is not to deny that the norm, while observable primarily in the aggregate, stems from many individual decisions.

For the two issues (x and y), the four relevant policy outcomes—$(\tilde{x},\hat{y})$, $(\tilde{x},\tilde{y})$, $(\hat{x},\hat{y})$, $(\hat{x},\tilde{y})$—and their associated subjective probabilities of occurrence are illustrated in figures 1 and 2. The senator's estimates of the probabilities are defined as:

$p = \Pr(\tilde{x} \mid \alpha)$ = the probability that no bill passes on x if he consents to the UCR,

$-q = \Pr(\hat{y} \mid \alpha)$ = the probability that a bill passes on y if he consents to the UCR,

$p' = \Pr(\tilde{x} \mid \beta)$ = the probability that no bill passes on x if he objects to the UCR,

$q' = \Pr(\hat{y} \mid \beta)$ = the probability that a bill passes on y if he objects to the UCR.

Thus, by necessity,

$$1 - p = \Pr(\hat{x} \mid \alpha) \qquad 1 - p' = \Pr(\hat{x} \mid \beta)$$
$$1 - q = \Pr(\tilde{y} \mid \alpha) \qquad 1 - q' = \Pr(\tilde{y} \mid \beta),$$

each of which has the obvious interpretation. Note that p terms always refer to issue x, q terms always refer to issue y, terms without primes presume the senator's consent (α), and terms with primes presume his objection (β). By construction, and as illustrated in figure 1, the possible outcomes are both mutually exclusive and exhaustive under either strategy.

The labels assigned to payoffs in figure 1 correctly suggest that the formal characterization takes on the flavor of a repeated play prisoner's dilemma game, even though only one actor's behavior is modeled. Choice of the strategy of consent (α) is analogous to cooperation, while objection (β) is a form of defection. Accordingly, the terms describing the outcomes in figure 1 are duplications or variations of those in Axelrod (1981, 1984). Senators are tempted to object to a UCR because to object kills the bill on issue x. Given objection, retaliation may or may not occur during future consideration of issue y. If other senators do not retaliate, the gamble pays off, a bill is passed on y, and the senator receives the maximum TEMPTATION payoff. (Utilities are introduced below.) However, if retaliation occurs—such as an objection by another senator to a UCR on issue y—the status quo remains in effect on both issues. The senator therefore receives the PUNISHMENT payoff: his immediate gain from deviation from the norm of consent on issue x results in a subsequent penalty on issue y.

FIGURE 1

PROBABILITIES, OUTCOMES AND PAYOFFS UNDER CONSENT AND OBJECTION

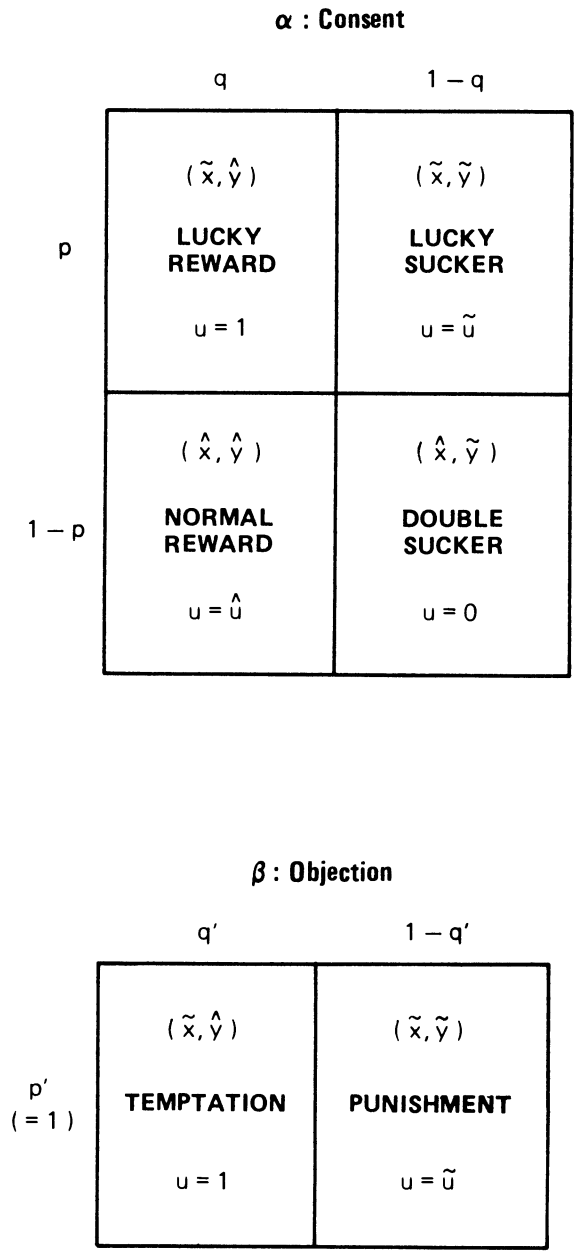
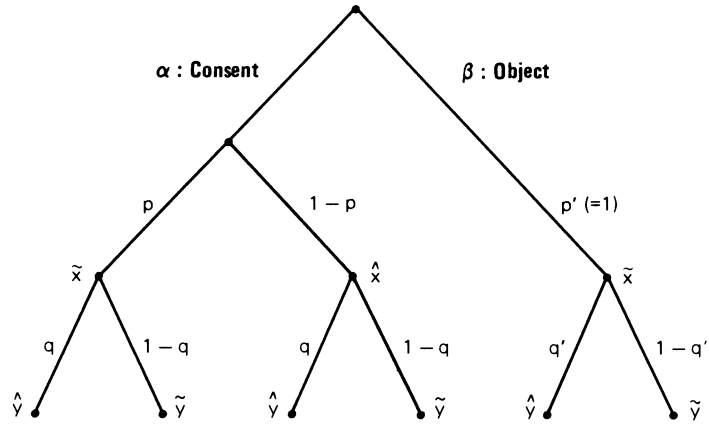


FIGURE 2

SENATOR'S DECISION TREE FOR A UNANIMOUS CONSENT REQUEST ON ISSUE X



Outcome:	$(\tilde{x}, \hat{y})$	$(\tilde{x}, \tilde{y})$	$(\hat{x}, \hat{y})$	$(\hat{x}, \tilde{y})$	$(\tilde{x}, \hat{y})$	$(\tilde{x}, \tilde{y})$
Probability:	pq	$p(1-q)$	$(1-p)q$	$(1-p)(1-q)$	q'	$1-q'$
Payoff:	1	$\tilde{u}$	$\hat{u}$	0	1	$\tilde{u}$

The larger set of outcomes under consent contains variations of reward and sucker payoffs. Rewards for consent—outcomes $(\tilde{x},\hat{y})$ and $(\hat{x},\hat{y})$—occur whenever a bill is passed on issue y. If a bill on x does not pass in spite of the senator's consent to its UCR (for example, if someone else objects), then the consenting senator receives the LUCKY REWARD payoff. He is lucky on issue x and his cooperation is subsequently rewarded by unanimous consent to consider an ultimately passing bill on issue y. But if he is less fortunate on x but nevertheless wins on y, the NORMAL REWARD is the payoff from the pair of bills, $\hat{x}$ and $\hat{y}$.

Of course the senator cannot expect rewards to occur with certainty. If he consents to the UCR for x but his consent is not reciprocated, he will have been suckered. His payoff is either that of a LUCKY SUCKER (if he wins on x but loses on y) or of a DOUBLE SUCKER (if he not only is suckered into consent on x but also is double-crossed on y).

Formally, the assumptions are:

A1. *Minimal temptation.* On issue x the senator prefers the status quo, $\tilde{x}$, to the expected bill, $\hat{x}$.

A2. *Nontrivial time horizon.* There exists a future issue y on which the senator prefers $\hat{y}$ to $\tilde{y}$.

A3. *Objection is deadly.* $p' = 1$.

A4. *Objection is probabilistically costly.* $q' < q$.

A5. *Separable, von Neumann-Morgenstern utility functions.* For $x = \tilde{x},\hat{x}$ and $y = \tilde{y},\hat{y}$, there exist utility functions u, u_1 and u_2 such that $u(x,y) = u_1(x) + u_2(y)$.

Assumption 1 is self-explanatory. Assumption 2 loosely resembles Axelrod's "shadow of the future" since the senator is interested in passing some bill after issue x is considered.[5] Assumption 3 embodies the power of objection and reinforces the temptation to object, while assumption 4 captures possible future costs of present objection. Assumption 5 provides for normalized payoffs, represented as utilities. In particular, assumptions 1, 2 and 5 permit assignment of payoffs as follows:

$u(\tilde{x},\hat{y}) = 1$, $u(\hat{x},\tilde{y}) = 0$,
$u(\tilde{x},\tilde{y}) = \tilde{u}$, and $u(\hat{x},\hat{y}) = \hat{u}$, where
$0 < \tilde{u}, \hat{u} < 1$.

Additionally, assumption 5 implies an expected utility representation of the decision. Given strategies α (consent) and β (objection), a senator chooses consent if and only if

$$Eu(\alpha) \geq Eu(\beta)$$

and, conversely, chooses objection if and only if

$$Eu(\beta) > Eu(\alpha),$$

where

$$Eu(\alpha) = pqu(\tilde{x},\hat{y}) + p(1 - q)u(\tilde{x},\tilde{y}) + (1 - p)qu(\hat{x},\hat{y}) + (1 - p)(1 - q)u(\hat{x},\tilde{y}), \quad (1)$$

and

$$Eu(\beta) = p'q'u(\tilde{x},\hat{y}) + p'(1 - q')u(\tilde{x},\tilde{y}) + (1 - p')q'u(\hat{x},\hat{y}) + (1 - p')(1 - q')u(\hat{x},\tilde{y}). \quad (2)$$

Thus a senator's decision about whether to consent or to object to a UCR for issue x is determined by the relative values of his expected utility terms, given in equations (1) and (2).

As figure 2 illustrates, equations (1) and (2) are unnecessarily general in light of other assumptions. Normalization ensures that $u(\hat{x},\tilde{y}) = 0$, and deadly objection (A3) precludes the possibility of outcomes $(\hat{x},\hat{y})$ and $(\hat{x},\tilde{y})$

[5] A1 and A2 could be omitted in a more general treatment, but the results would be relatively uninteresting. Alternatively, it is possible to incorporate a discount parameter that would capture the magnitude of importance of issues over time. For present purposes, however, it suffices to employ the relatively parsimonious model.

whenever a member objects to the UCA for issue x. Consequently, the decision tree (figure 2) contains only six terminal nodes, and equations (1) and (2) can be simplified as:

$$Eu(\alpha) = pq + p(1 - q)\tilde{u} + (1 - p)q\hat{u} \tag{1'}$$

$$Eu(\beta) = q' + (1 - q')\tilde{u}. \tag{2'}$$

Subtraction of (1') from (2') produces the senator's decision rule:

$$\beta \Leftrightarrow q' - pq + [(1 - q') - p(1 - q)]\tilde{u} - (1 - p)q\hat{u} > 0. \tag{3}$$

The inequality states the necessary and sufficient conditions for objection (β) to a UCR on issue x and is the basis for the more concise and interpretable result that follows.

Proposition. A senator will object to a unanimous consent request on issue x if and only if

$$\frac{\tilde{u}}{\hat{u}} > \frac{q - q'}{1 - p}.$$

Proof. See Appendix.

There are several ways to interpret the result. Most generally, the expression says that objection occurs if and only if for some senator the ratio of no bills ($\tilde{u}$) to two bills ($\hat{u}$) exceeds the ratio of the net probability loss from objection ($q - q'$) to the probability of short-term luck ($1 - p$).

A few special cases clarify individual parts of the expression. First, suppose that senators are sure of the consequences of their acts. Specifically, they know that $p = 0$ (consent is tantamount to surrender on x), $q = 1$ (consent ensures victory on y), $p' = 1$ (objection kills x), and $q' = 0$ (objection on x always invokes punishment on y). Substituting these values into (3') immediately produces $\tilde{u}/\hat{u} > 1$ as a condition for objection (β). This further implies that $\beta \Leftrightarrow \tilde{u} - \hat{u} > 0$. Separability (A5) permits expansion of this simplified condition to $\beta \Leftrightarrow u(\tilde{x}) + u(\hat{x}) - u(\tilde{y}) + u(\hat{y}) > 0$. Reordering produces the intuitive result that objection occurs if and only if

$$u(\tilde{x}) - u(\hat{x}) > u(\hat{y}) - u(\tilde{y}),$$

i.e., whenever the net benefit from killing the bill on x exceeds the net benefit from passing the bill on y. This rather obvious condition for an extraordinarily tidy world introduces an important theme that recurs in less restrictive situations: rational senators weigh short- and long-term factors when making an immediate decision. In this case, a senator deviates from the norm of consent only if the costs of certain loss in the future are exceeded by the benefits of certain victory in the present.

A second, less restrictive interpretation imposes only one element of certainty, namely certain punishment ($q' = 0$). Now (3′) simplifies to

$$\frac{\tilde{u}}{\hat{u}} > \frac{q}{1 - p}.$$

The imposition of the expectation of certain punishment can be interpreted as an assumption on the part of the senator that there is always at least one other senator who will play tit for tat.[6] Then a rational senator systematically compares his relative evaluations of outcomes $(\tilde{x},\tilde{y})$ and $(\hat{x},\hat{y})$ with his relative estimates of the probabilities that bills $\hat{x}$ and $\hat{y}$ pass if he consents. Suppose one of the two ratios equals one. If, for example, the senator contemplates consent and estimates that the corresponding probabilities that $\hat{x}$ and $\hat{y}$ will be passed are equal ($q = 1 - p$), then he objects to the UCR for x if and only if $\tilde{u} > \hat{u}$, which means that he prefers no bills to the bundle of bills. Similarly, if he is indifferent between both bills and no bills ($\tilde{u} = \hat{u}$), then the only circumstances under which he objects to the UCR on x is when he regards $\hat{y}$ as less likely to be passed than $\hat{x}$, i.e., when $q < 1 - p$. In sum, two forces can instigate deviations from the norm of consent in a world of sure punishment: a strong preference for the status quo over a package of bills, and/or pessimism about the prospects of passage of the second bill in spite of consent to consider the first.

While each of the above interpretations imposes special restrictions, the centrality of long-term and short-term costs and benefits in the decision calculus extends to the most general case. This is illustrated by two additional interpretations that impose no special restrictions. Reordering (3′) as

$$(q - q') > \frac{\tilde{u}}{\hat{u}}(1 - p) \qquad (3'')$$

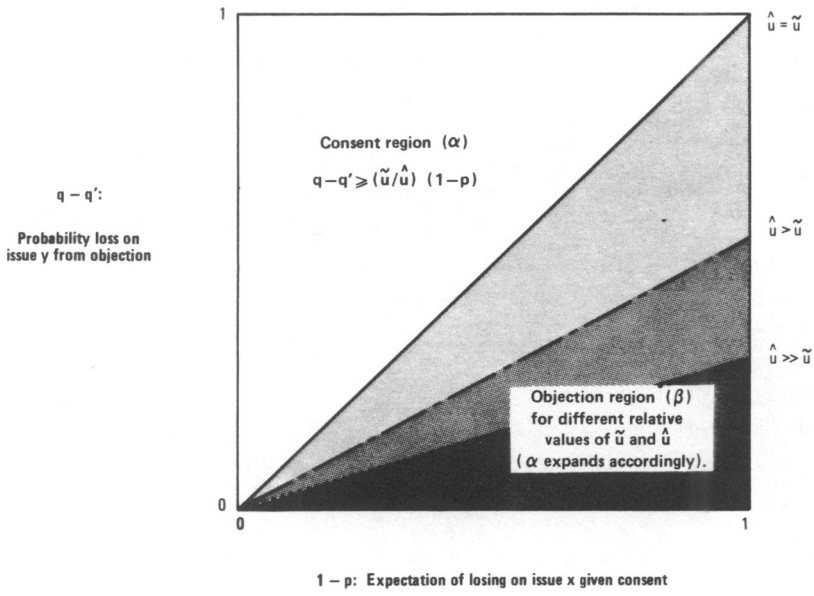
allows situations to be represented on a unit square on which the horizontal axis $(1 - p)$ is the senator's expectation of loss on issue x under consent, and the vertical axis $(q - q')$ is the net probability loss on issue y from objection. As figure 3 illustrates, (3″) defines a line that passes through the origin and has slope $\tilde{u}/\hat{u}$. Thus for any given ratio of $\tilde{u}$ to $\hat{u}$ (the slope in 3″), the corresponding line is a set of points of minimal consent. Any such line partitions the square into regions of consent and objection. Thus the strategy of a senator with any given values of $\tilde{u}$ and $\hat{u}$ is determined

[6]Note, however, that this is not necessarily a reasonable assumption. If the other senator is employing the same decision rule, the first senator's y at time t is the second senator's x at t + 1, moreover, an x which he may not be willing to kill at the expense of retaliation at t + 2. To minimize such complexities, attention is restricted to the individual decision-theoretic model, even though an n-person game-theoretic model may be preferable.

by his probability assessments (1 - p) and (q - q'). He objects only if the pair of values represents a point below the minimal consent line.

FIGURE 3

INTERPRETATION OF THE CONDITION FOR OBJECTION



*Lines represent points at which consent is most weakly preferred to objection, because for the given values of ũ and û, and Eu(β) - Eu(α) = 0.

The geometric interpretation can be used to illustrate several comparative statics results that are derived below. The most visually intuitive of these is the ceteris paribus effect of a change in the slope of the line, which would be induced by a change in ũ or û (or both). Because a decrease in the slope of the consent line necessarily shrinks the area of objection, a senator's increasing assessment of two bills ($\hat{x}$ and $\hat{y}$) and/or decreasing assessment of no bills ($\tilde{x}$ and $\tilde{y}$) can change his strategy in at most one way: from objection to consent. Actual instances of such changes are presented in part III. But first, general and testable hypotheses are derived with comparative statics on the condition in the proposition.

Let E be the senator's net expected utility from objection, Eu(β) - Eu(α). Reordering equation (3') and setting it equal to E yields

$$E = q'\hat{u} - q\hat{u} + \tilde{u} - p\tilde{u}. \tag{4}$$

Stated generally, the question of interest is: how does a change in any given parameter ($\tilde{u}$, $\hat{u}$, p, q or q′) affect a senator's net expected utility (E)? Total differentiation of (4) provides the answers.

$$dE = \frac{\partial E}{\partial \tilde{u}} d\tilde{u} + \frac{\partial E}{\partial \hat{u}} d\hat{u} + \frac{\partial E}{\partial p} dp + \frac{\partial E}{\partial q} dq + \frac{\partial E}{\partial q'} dq'$$
$$= (1-p)d\tilde{u} + (q'-q)\, d\hat{u} - \tilde{u}dp - \hat{u}dq + \hat{u}dq' \qquad (5)$$

The five partial derivatives in (5) have natural interpretations. Each states the precise effect on E of a change in a given parameter, holding all other parameters constant. Incorporating the range of values and the substantive meaning of the parameters enables derivation of five corresponding hypotheses. (The hypotheses are stated in terms of changes in the senator's net expected utility from objection, but the obvious converses hold.) Ceteris paribus:

H1. An increase in a senator's evaluation of the no bills outcome will increase his net expected utility from objection, because

$$\partial E/\partial \tilde{u} = (1 - p) > 0.$$

H2. An increase in a senator's evaluation of the two bills outcome will decrease his net expected utility from objection, because (by A4)

$$\partial E/\partial \hat{u} = (q' - q) < 0.$$

H3. An increase in a senator's estimate that no bill will pass on x if he consents will decrease his net expected utility from objection, because

$$\partial E/\partial p = - \tilde{u} < 0.$$

H4. An increase in a senator's estimate that a bill will pass on y if he consents will decrease his net expected utility from objection, because

$$\partial E/\partial q = - \hat{u} < 0.$$

H5. An increase in a senator's estimate that a bill will pass on y if he objects will increase his net expected utility from objection, because

$$\partial E/\partial q' = \hat{u} > 0.$$

While most if not all of the hypotheses are consistent with informal intuitions about senators' behavior, they convey more information than mere common sense or geometric representations yield. The following cases were selected to determine whether this information is useful.

III. Two Cases

There are two related obstacles to a direct and large N test of the theory. The first and obvious limitation is the inability to measure $\tilde{u}$, $\hat{u}$, p, q, and q′. The second and more subtle limitation concerns what can be observed. Negotiations of UCAs occur primarily off the Senate floor. Leaders seek out and try to accommodate senators with a strong interest in the legislation to be considered under the terms of the agreement. During the floor stage, one of two things typically happens. In most cases, unanimous consent is obtained (hence the "norm"); in a few cases a senator objects and the request is withdrawn. Unfortunately, neither pure type of observation permits a test of the theory because of the inability to take the relevant measurements. However, there is a useful third class of observations, namely, cases on the Senate floor in which objections to UCRs are followed by public negotiations that eventually result in consent. Although the measurement problem remains, it is nevertheless possible to use the public record to determine at least how the unmeasurable terms changed during negotiations. By focusing on observable changes in parameters whose values cannot be known absolutely, the correspondence between the observations and the theoretically derived hypotheses can be assessed.

Empirical analysis of two cases serves three purposes. First, descriptions of the cases provide a richer view of how complex unanimous consent agreements are reached on the floor of the contemporary Senate. Second, the attempt to interpret senatorial behavior permits an assessment of whether the formal terms of the theory have empirical referents. Finally, the joint focus on theory and observation provides a minimal opportunity to reject the theory or, barring rejections, to discover important omissions that might be incorporated into extensions.

Case 1: Dairy and Tobacco Adjustment Act of 1983. On October 5, 1983, Senate Majority Leader Howard Baker interrupted a pending motion regarding authorizations for the Department of State to introduce a unanimous consent request for S. 1529. The purpose of the act was to create a paid diversion plan to induce dairy farmers to produce less milk, and make adjustments in the acreage allotment and marketing quota systems in federal tobacco programs.[7] It immediately became clear that the proposed UCR was ambiguous about the amendments to be permitted. Senator Melcher (D-MT) reserved the right to object to the request, and his key concern coincided with that of several senators from agriculture-intensive states. Melcher asked whether amendments pertaining to target prices for commodities such as wheat, corn, cotton

[7] See *Congressional Quarterly Weekly Report*, October 8, 1983, p. 2076.

or rice would be permitted during debate of the dairy and tobacco act. Baker's response was frank.[8] "Yes, Mr. President. The bill will be open to amendment in general, as it is under the rules of the Senate. I know that, in addition to the dairy-tobacco bill, there is a serious controversy that revolves around the target price issue, which I believe is the subject of another bill. Target prices, of course, could be offered to this bill as an amendment unless we provided by unanimous consent that that would not be the case." This evoked an outright objection from Senator Exon (D-NB), on which Melcher subsequently elaborated: "I am not at all happy with the situation . . . that an amendment dealing with the target prices on wheat or other commodities would be offered." Baker attempted to accommodate Melcher, inquiring how "the Senator [would] react if a unanimous consent agreement were entered into that would forbid a target price amendment to this bill?" Exon responded favorably. "I would withdraw my objection to taking up the bill if we could get a unanimous consent agreement that it would be on tobacco and dairy only and if there were a prior agreement on the matter of target prices that would not come up as an amendment thereto."

Although the preferred agreement seemed to be one resembling a closed rule, Senator Dole (R-KS) then entered the chamber. Baker correctly anticipated that Dole would have something to say on the matter of target prices for wheat. Consistent with Melcher, Exon and Zorinsky, Dole wanted to ban all amendments on target prices. However, he "would not consent that we cannot offer amendments to the tobacco and dairy bill." In other words, he wanted a guarantee of strict germaneness: amendments should be permitted, but only if they pertain to the immediate content of the bill, namely dairy and tobacco farming.

Complications and intensity increased when objecting or objection-threatening senators drew attention to the possibility that a trade had been arranged between Agriculture Secretary Block and senators from dairy and tobacco states. Zorinsky (D-NB) claimed that the chairman of the Agriculture Committee, Senator Jesse Helms (R-NC), and its members had met with Block, "who attempted to initiate a quid pro quo in agreeing to what he called a very bad dairy bill, if, in effect, we would deliver to him sufficient votes to offset the money there, to take it out of the hide of the wheat people in putting a target price freeze on wheat."[9]

[8] All excerpts are from the October 5, 1983, *Congressional Record*, pp. S 13608-17.

[9] He went on, however, to "compliment the dairy people, because their answer . . . to the Secretary of Agriculture was in the negative, [and] that they want no part of the type of involvement in the subterfuge that takes place on a daily basis . . . in the Senate Chamber. Once again, it substantiates the fact that . . .there are two things people do not want to see done . . . watching sausage made and watching a legislature pass laws."

Charges and countercharges occupy several pages in the *Record*, but a description of the outcome and interpretation of how senators' likely preferences and subjective probabilities encouraged objection is more important for present purposes than is a continued summary of the debate. The winners of the immediate dispute were the senators who objected to the original UCR. The renegotiated agreement stated that "no amendments relative to target prices or loan rates relating to commodities other than dairy or tobacco shall be in order" (p. 13617), which is precisely the narrowly applied germaneness rule that Dole requested.

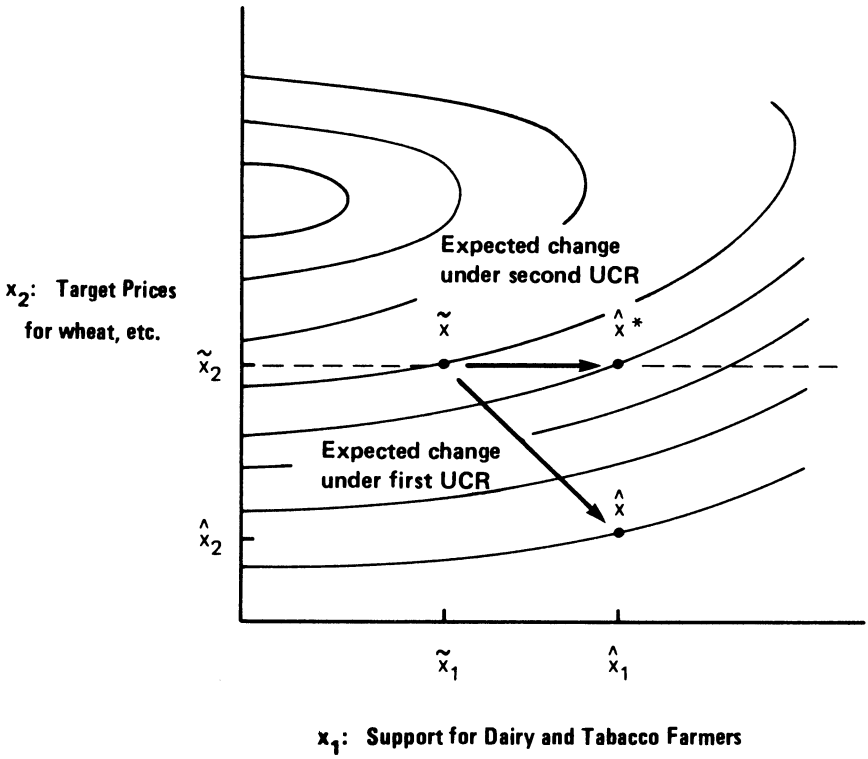
The situation is depicted formally in figure 4, which helps account for the objections to the original UCR. The original bill pertained to dairy and tobacco policy, which for purposes of exposition is collapsed onto one dimension, x_1. The second dimension, x_2, represents target prices for other commodities (wheat, cotton, rice and corn). From a narrow perspective, the Agriculture Committee's bill was an attempt to change policy only in a pro-dairy and tobacco direction, from $\tilde{x}_1$ to $\hat{x}_1$ on the horizontal axis. However, senators from states affected by target prices were not particularly interested in dairy and tobacco and consequently had a broader perspective. Familiar with the rules of the Senate in which germaneness is conceived more broadly than in the House, these senators behaved as if the status quo were the two-dimensional point, $\tilde{x}$, which provided for moderately high target prices and moderate support for dairy and tobacco farmers. The key point is that the expected outcome under the original UCR consisted of a change in *two* directions—more favorable programs for dairy and tobacco farmers (about which they cared little) *and* reductions in target prices (about which they cared a great deal). Therefore, as represented by the elliptical indifference curves, the policy change in the two-dimensional space from $\tilde{x}$ to $\hat{x}$ was highly undesirable under the initial unanimous consent request.[10]

What, then, did the objectors gain in the second UCR, and how well does it conform to the theory? The "proposal germaneness" (Shepsle, 1979) provision they sought and attained has a simple spatial interpretation: it confines the set of permissible amendments to the x_1 dimension represented by the dotted line passing through $\tilde{x}$. When objecting senators were assured that policy on the target price dimension, x_2, would remain fixed at $\tilde{x}_2$ during consideration of S.1529, their expected outcome too could change only in the horizontal direction. Therefore, $\hat{x}^*$ in figure 4 represents their expectation under the second unanimous consent request.

[10] The precise locations of the points in figure 3 are not central to the argument, provided that the indifference curves of objectors are elliptical in the manner shown.

FIGURE 4

OBJECTOR'S PREFERENCES AND PERCEPTIONS OF UCRS FOR THE DAIRY AND TOBACCO ADJUSTMENT ACT



The geometric representation of the location of $\hat{x}^*$ on a much higher utility contour than $\hat{x}$ has a precise analogue in the theory, namely a positive change in $\hat{x}$, which, holding y constant, can be treated as a positive change in $\hat{u}$. Hypothesis 2 states that $\partial E/\partial \hat{u} = (q' - q) < 0$, meaning that, holding other parameters constant, a positive change in the value of the projected outcome makes objection *less* attractive. Although there obviously is no precise gauge for the initial or terminal states of the relevant senators' calculations, the theory and the situation can be inspected more closely to estimate how responsive the initial objectors were likely to have been to the change in $\hat{u}$ that presumably resulted from the new UCR.

The substantive interpretation of the hypothesis is that the magnitude of reduction in a senator's net expected utility from objection is proportional to his expectations of punishment (1 - q') and/or likelihood

of reward (q). The intensity of the debate during the initial UCR and the broader legislative setting provide insights into the likely values of the key terms. Although the two factions sparred over short-term procedural issue, they were natural allies when it came to the long-term substantive issue of continued support for American agriculture. Recall that in his introductory remarks, Baker alluded to a pending, separate bill on target prices. Thus initially objecting senators probably believed that there was high probability of punishment if their objections killed the Dairy and Tobacco Bill. Theoretically, this suggests a large 1 - q′ (probability of punishment, given objection) and by necessity a small q′. Similarly, on the consent side of the equation senators probably believed that cooperation on the Dairy and Tobacco Bill would be rewarded later in the session when target prices were to be considered independently. Therefore q was probably reasonably large and q′ - q was large and negative.

The formal upshot from these impressionistic assessments is that each of the likely values—a large positive change in û, a high q, and a low q′—would produce a large negative change in E, thereby making objection a much less attractive strategy under the second UCR. Thus the observed behavior supports the theory.

Case 2: Martin Luther King Holiday. HR 3706, a bill to create a national holiday in honor of Martin Luther King, Jr., passed with strong support (338-90) of members on the House of Representatives on August 2, 1983. Senate leaders had hoped to act on HR 3706 on October 3, but their plan was aborted when Senator Jesse Helms launched a filibuster just as the bill came to the floor under the normal rules. The leadership of both parties responded by filing for cloture. The vote on cloture was scheduled for October 5, but even if cloture had been successful, the number of pending amendments was sufficient to tie up the Senate as it was trying to conclude its business before the Columbus Day recess. Given these constraints, Howard Baker mounted a last-ditch effort to circumvent the normal rules by proposing that the bill be considered under a unanimous consent agreement. He was pessimistic when introducing the request. "Mr. President, as I indicated last evening, I wish to propound a unanimous consent request. I am by no means sure that it will be agreed to and, as a matter of fact, I have been advised that it probably will not be agreed to. However, I would like to go ahead and propound the request at this time."

The provisions of Baker's initial UCR were:

- the pending cloture vote would be vitiated
- the Senate would consider HR 3706 at 10 a.m. on October 18, 1983
- Senator Helms would be recognized to offer a motion to commit the bill to the Judiciary Committee

- debate on the bill would be limited to four hours
- amendments may be offered but debate would be restricted to one hour for each amendment[11]
- debate on second-degree amendments, appeals, points of order, or other motions would be restricted to thirty minutes
- final passage would occur on or before 2 p.m. on Wednesday, October 19 and
- "that the agreement be in the normal form."[12]

Most of the provisions are self-explanatory and were not controversial. The provision setting a time for final passage would preclude a filibuster and therefore was potentially objectionable to opponents of the bill. But surprisingly, the last provision became more important. Immediately after the UCR was proposed, Baker expounded on "the normal form" by stating that "no amendments would be in order except amendments that were germane to the bill itself." This led Senator Gordon Humphrey (R-NH) to reserve the right to object, presumably because he wanted more details on the amendments that would be permitted under the UCR. Humphrey's claim was that "it is certainly not my wish to delay the final passage of the bill. I do, however, object to the provision which, if I understood it correctly, sets a time certain for final passage. As one of the opponents of the bill, I intend to offer one or two amendments."

Baker was reluctant to offer a guarantee to Humphrey that his amendments could be considered. When the presiding officer asked whether Baker wished to modify his request, he responded: "No, Mr. President, I do not. The request was negotiated with many Senators over a long period of time and is a package. And, honestly, I think if I were to modify it to accommodate the wishes of the Senator from New Hampshire—which is a perfectly legitimate request . . . it would make the agreement unacceptable to a number of Senators because there would no longer be any practical limit on the length of time that could be consumed in the debate on this measure . . . . So, without a time certain, I am afraid that the arrangement would fall apart."

In the subsequent debate it became clear that Humphrey did not object to the provision of the UCR setting a time for final passage as such, but rather merely wanted a reasonable assurance that his amendments would be considered. Interestingly, even Senator Helms exhorted Humphrey not to object. After a few minutes of formal negotiation, Senator Baker suggested the absence of a quorum. During the first quorum call, the conferring senators were unable to reach a new agreement, so Senator Moynihan requested another quorum call to allow the informal

[11] The specific amendments were not mentioned in the UCR.

[12] Except where quoted, the provisions are paraphrased from the *Congressional Record*. Quotations that follow are all extracted from the *Record*, October 5, 1983, pp. S 13606-8.

negotiations to continue. When a new tentative agreement was reached, Baker asked and received unanimous consent that the quorum call be rescinded (an example of a simple UCA) and proposed a modified UCR that ultimately satisfied Senator Humphrey. There were only three changes in the second UCR. Two of them extended the allotted time for debate (moving to 9 a.m. the time at which the bill was to be taken up, and extending to 4 p.m. the time by which a final vote was to be taken). The third change waived paragraph four of rule XII, thereby permitting the new UCR to be agreed to in the absence of a quorum (since a few Senators were on the floor when the new agreement was negotiated).

The example illustrates the practice of bending but not breaking the norm of consent by reserving the right to object without rejecting outright. The case also raises two difficult questions. First, why did Humphrey nearly object to the proposed agreement and then withdraw his objection? And perhaps more puzzling, why did Helms, who had previously filibustered against the King holiday, give his consent to the UCR that precluded a filibuster? A closer examination of the case, including preceding and subsequent events, provides tentative answers to these narrow questions and has broader implications for leadership strategy.

A reading of the *Record* makes it clear that Humphrey's strategy of threatening to object to the UCR resulted in his right to propose two amendments that otherwise would not have been considered. But the fit between the facts and the theory is not immediately obvious as Humphrey seemed not to expect that his amendments would pass.[13] For example, he introduced one amendment by saying, "Mr. President, I am under no illusions. A colleague observed to me a moment ago that this bill is unamendable, that you could not even amend the pledge of allegiance to the bill, and I believe he is probably correct."

Position-taking provides an explanation for Humphrey's change from objection to consent. The congressional literature is rich with examples of members benefiting from symbolic behavior independent from policy outcomes (Mayhew, 1974). If accordingly a senator's assessment of an outcome incorporates both policy and process, then Humphrey's behavior can be explained by the theory. The evidence suggests that Humphrey accepted $\hat{x}$ as a foregone conclusion but nevertheless valued greatly an agreement that permitted him to offer two amendments during which he could make known his position for economical operation of government.[14] Thus the change can be interpreted as an increase in the $u(\hat{x})$ component

[13] Indeed, his amendments were defeated 16-74 and 11-83.

[14] One of his amendments was to change the date of the holiday to the third Sunday in January; the other was to move the Lincoln holiday to Sunday instead of having a King holiday. When arguing for each amendment, he stressed the money they would save.

in $\hat{u}$, where $u(\hat{x})$ includes opportunities for position-taking in addition to the value associated with the expected bill. Hypothesis 2 suggests that such a change should decrease the attractiveness of objection, which is consistent with Humphrey's change in behavior from near objection to consent.

On its surface, Helms's consent to the UCR for the Martin Luther King holiday seems inconsistent with the theory. He strongly preferred no holiday ($\tilde{x}$) to a holiday ($\hat{x}$) and had previously filibustered the bill. Yet when the UCR that set a time to vote for final passage was proposed, he did not object. The key to understanding Helms's consent is Baker's scheduling strategy, the effects of which are consistent with hypotheses 4 and 5. Two points are revealing. First the UCAs for both the King holiday and the Dairy and Tobacco Act were negotiated on October 5. Second, Baker's proposed UCR for the King holiday immediately preceded the UCR for the Dairy and Tobacco Act. Combined with the crowded legislative calendar and approaching Columbus Day recess, this sequencing may well have changed Helms's estimates of the probabilities of reward for consent (q) and punishment for objection (1-q'). Specifically, had Helms objected to the UCR for the King holiday, the chances of reaching an agreement for the Dairy and Tobacco Act would have been less likely. Similarly, had he stopped trying to kill the popular King holiday bill (which ultimately passed 78-22), his chances for receiving cooperation during the relatively compact schedule were probably enhanced. Formally, the change in q was positive and the change in q' was negative. By hypotheses 4 and 5, each of these changes should diminish the net expected benefit from objection. Of course we cannot be sure that had this scheduling not occurred, Helms would have continued his efforts to kill the King bill. But the back-to-back propoundment of the two UCRs almost surely made deviation from the norm of consent a much less desirable strategy.

IV. Implications

The general statement of the theoretical result—that senators frequently consent to UCRs because it maximizes expected utility—may seem vacuous when considered alone. But if the cases examined are typical, the theory takes on additional significance in light of the observed tendency of the Senate leadership to exploit others' maximization calculi to induce cooperation. Several theorists have recently addressed the question of how cooperation evolves and persists in Congress—an institution that is presumably increasingly "individualized" (Ehrenhalt, 1982). Although their answers vary, they share the view that bargains are rarely struck explicitly, and that even implicit deals are nonbinding. Nevertheless, cooperative behavior is sufficiently common that it creates

the appearance of a norm in the conventional sense. Ferejohn (1985), for example, attributes the instigation and persistence of food stamps and agricultural programs to jurisdictionally and preference-induced logrolls. Shepsle and Weingast (1985) argue that the reason committees rarely get "rolled" on the floor is neither because of the apparent "norm of deference" nor because of insufficient temptations for noncommittee members to propose amendments, but rather because the committee possesses an ex post veto in the conference committee stage. And Axelrod (1984) offers interpretations of Congress based on his study of repeated play two-person prisoner's dilemma games.

The theoretical results on unanimous consent agreements are not necessarily inconsistent with such explanations. Although UCAs are binding, members cannot be forced to enter into them. Nor can they be punished formally for reneging on implicit (or for that matter explicit) quid pro quos in the form of, say, mutual consent pacts. But the subtler empirical insight of this study stems from the existence of endogenous institutional features, such as the unanimous consent procedure, and from the ability of leaders to manipulate parameters in other senators' decision rules. These facts of senatorial life are opportunities, indeed invitations, for leaders to construct situations in which potential defectors' extreme temptations to object are tempered by the prospect of severe costs, such as the loss to Jesse Helms of a prized tobacco bill. In the absence of binding agreements, endogenous institutions may be the next best thing when, as UCAs, they permit leaders to construct situations in which the socially desired behavior is rational by individual cost-benefits standards. In short, even Dole's "free spirit" senators often can be induced to "go along."

A closely related but largely unexplored theme is the stability (or instability) of outcomes in settings with endogenous institutional arrangements. Some theorists have suggested that if members of an institution are permitted to change its rules (as senators do whenever they enter into a UCA), then many or most of the chaos theorems (e.g., McKelvey, 1976; Schofield, 1978) pertain also to collective choices of institutions, except that perhaps preferences regarding institutions are relatively "congealed" (Riker, 1980). But this study suggests an argument against the dizzying prospects of endless cycling over the space of institutions. UCAs may reasonably be viewed as formal agendas selected by but ultimately imposed on senators. The agendas are remarkably binding; a UCA can be rescinded only by another UCA. Theoretically, then, the only way to cycle over these institutional arrangements would be for all senators to change their minds. A necessary condition for chaos in institutional choice therefore would be extreme fluidity of preferences. Since empirically this is an unlikely prospect, the endogeneity of institutions such as UCAs would seem to induce stability, not undermine

it. Given that UCAs are reached with increasing frequency (albeit sometimes painstakingly), and deferring the difficult question of what form UCAs take, a reasonable conjecture is that the existence of structure-induced equilibria, à la Shepsle (1979), need not depend upon exogenously imposed institutions. Equilibrium outcomes may exist even when the "structures" are endogenous and situation-specific. Theoretical speculation aside, however, the more reliable point is that institutional features such as UCAs are frequently employed cases of institutional endogeneity and thus fertile testing grounds for forthcoming theories of institutional choice.

Summarizing more narrowly, this study has employed an explicitly individual and strategic perspective on congressional norms and has assessed its usefulness for answering the question of when and why senators go along with unanimous consent requests. The correspondence between the theory and the cases suggests that norm-related strategies vary in systematic and potentially predictable ways. At minimum, the results underscore the hopeful prospects for continued study of congressional behavior using the strategic perspective. To reiterate, norms are not merely collective and regular standards of conduct; more specifically, they are products of individual and variable strategic decisions. Congressmen have reasons for choosing to conform to norms and neither more nor less selfish reasons for choosing to deviate.

Appendix

Proposition. A senator will object to a unanimous consent request on issue x if and only if

$$\frac{\tilde{u}}{\hat{u}} > \frac{q - q'}{1 - p}.$$

Proof. First note that $\tilde{u} + \hat{u} = 1$, since by definition $\tilde{u} = u_1(\tilde{x}) + u_2(\tilde{y})$ and $\hat{u} = u_1(\hat{x}) + u_2(\hat{y})$. Adding and rearranging yields

$$\begin{aligned}\tilde{u} + \hat{u} &= [u_1(\tilde{x}) + u_2(\hat{y})] + [u_1(\hat{x}) + u_2(\tilde{y})] \\ &= u(\tilde{x},\hat{y}) + u(\hat{x},\tilde{y}) \qquad \text{(by A5)} \\ &= 1 + 0 \\ &= 1.\end{aligned}$$

The remainder of the proof consists of simple algebraic manipulations and occasional use of the fact that $\tilde{u} + \hat{u} = 1$.

$$\beta \Leftrightarrow q' - pq + [(1-q') - p(1-q)]\tilde{u} - (1-p)q\hat{u} > 0 \tag{3}$$

$$q' - pq + \tilde{u} - q'\tilde{u} + pq\tilde{u} - p\tilde{u} - q\hat{u} + pq\hat{u} > 0$$

$$pq(\tilde{u} + \hat{u} - 1) + q' - q'\tilde{u} - q\hat{u} + \tilde{u} - p\hat{u} > 0$$

$$q' - q'\tilde{u} - q\hat{u} + \tilde{u} - p\tilde{u} > 0$$

$$q'(1 - \tilde{u}) - q\hat{u} + \tilde{u} - p\tilde{u} > 0$$

$$q'\hat{u} - q\hat{u} + \tilde{u} - p\tilde{u} > 0$$

$$\hat{u}\,(q' - q) + \tilde{u}(1 - p) > 0$$

$$\frac{q' - q}{1 - p} + \frac{\tilde{u}}{\hat{u}} > 0$$

$$\Leftrightarrow \quad \frac{\tilde{u}}{\hat{u}} > \frac{q - q'}{1 - p}$$

Q.E.D

References

Asher, Herbert. 1973. The Learning of Legislative Norms. *American Political Science Review*, 67:499-513.

Axelrod, Robert. 1981. The Emergence of Cooperation Among Egoists. *American Political Science Review*, 75: 306-18.

_____. 1984. *The Evolution of Cooperation*. New York: Basic Books.

Davidson, Roger H. 1985. Senate Leaders: Janitors for an Untidy Chamber? In Lawrence C. Dodd and Bruice I. Oppenheimer, eds., *Congress Reconsidered*, pp. 225-52. Washington, DC: Congressional Quarterly Press.

Ehrenhalt, Alan. Sept. 4, 1982. In the Senate of the '80s, Team Spirit Has Given Way to the Rule of Individuals. *Congressional Quarterly Weekly Report*, pp. 2175-82.

_____. April 7, 1984. Senate Leader's Job: Curbing Individualism. *Congressional Quarterly Weekly Report*, p. 819.

Ferejohn, John. 1985. Logrolling in an Institutional Context: A Case Study of Food Stamps Legislation. Paper prepared for the Weingart Conference on Formal Models of Voting, California Institute of Technology, March 22-23.

Fiorina, Morris P. 1977. *Congress: Keystone of the Washington Establishment*. New Haven: Yale University Press.

Huitt, Ralph K. 1961. The Outsider in the Senate: An Alternative Role. *American Political Science Review*, 55: 566-75.

Keith, Robert. 1977. The Use of Unanimous Consent in the Senate. *Committees and Senate Procedures*. 95th Congress: 2nd Session.

McKelvey, Richard D. 1976. Intransitivities in Multidimensional Voting Models and Some Implications for Agenda Control. *Journal of Economic Theory*, 12: 472-82.

Matthews, Donald R. 1960. *U.S. Senators and Their World*. New York: Norton

Mayhew, David. 1974. *Congress: The Electoral Connection*. New Haven: Yale University Press.

Oleszek, Walter J. 1976. Dissent on the Senate Floor: Practices, Procedures, and Customs. U.S. Library of Congress: Congressional Research Service.

_____ . 1984. Congressional Procedures and the Policy Process. Washington, DC: *Congressional Quarterly Press.*

Polsby, Nelson W. 1968. The Institutionalization of the U.S. House of Representatives. *American Political Science Review*, 62: 148-68.

Rohde, David W. Norman J. Ornstein, and Robert L. Peabody. 1985. Political Change and Legislative Norms in the U.S. Senate, 1957-1974. In Glen R. Parker, ed., *Studies of Congress.* Washington, DC: Congressional Quarterly Press, pp. 147-88.

Riker, William H. 1980. Implications from Disequilibrium of Majority Rule for the Study of Institutions. *American Political Science Review*, 52: 432-46.

Schofield, Norman, 1978. Instability of Simple Dynamic Games. *Review of Economic Studies*, 45: 575-94.

Shepsle, Kenneth A. 1979. Institutional Arrangements and Equilibrium in Multidimensional Voting Models. *American Journal of Political Science*, 23: 27-60.

Shepsle, Kenneth A., and Barry R. Weingast. 1981. Political Preferences for the Pork Barrel: A Generalization. *American Journal of Political Science*, 25: 96-111.

_____ . 1985. The Institutional Foundations of Committee Power. Paper prepared for the Weingart Conference on Formal Models of Voting, California Institute of Technology, March 22-23.

Weingast, Barry R. 1979. A Rational Choice of Perspective on Congressional Norms. *American Journal of Political Science*, 23: 245-62.

Weingast, Barry, R., Kenneth A. Shepsle, and Christopher Johnsen. 1981. The Political Economy of Benefits and Costs: A Neoclassic Approach to Distributive Politics. *Journal of Political Economy*, 89: 642-64.